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AMENDMENTS TO THE SPECIFICATION

Please amend page 68, paragraph [0097] as follows:

The electrospray (ES) mass spectra were recorded using a micromass Quattra LC mass spectrometer with methanol as the matrix [Masslynx software; open-access autosampler injection]. The infrared spectra were recorded as Nujol mulls between 0.5 mm NaCl plates on a Perkin Elmer 1600 series. <sup>1</sup>H and <sup>13</sup>C NMR spectra were recorded on a Bruker ARX spectrometer 250/300 Hz; chemical shifts (ppm) are referred to the residual protic solvent peaks. The reagents, sodium t-butoxide the aryl bromides were purchased from Aldrich Chemical Co. and used without further purification. rac-BINAP (rac-2,2'-bi(diphenylphosphino)-1,1'-binaphthyl) was purchased from Strem Chemical Co. The compounds, Pd<sub>2</sub>(dba)<sub>3</sub> Pd<sub>2</sub>(dba)<sub>3</sub> (tris(dibenzylideneacetone)dipalladium(0) used as the chloroform solvate) [1], {(2-C<sub>5</sub>H<sub>4</sub>N)CH<sub>2</sub>}2NH (dpa) {(2-C<sub>5</sub>H<sub>4</sub>N)CH<sub>2</sub>}2NH (dpa) [2], (H<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>) {(2-C<sub>5</sub>H<sub>4</sub>N)CH<sub>2</sub>}NH (H<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>) {(2-C<sub>5</sub>H<sub>4</sub>N)CH<sub>2</sub>}NH [3], 2-bromo 1,3,5-i-Pr<sub>3</sub>C<sub>6</sub>H<sub>2</sub> 2-Bromo-1,3,5-i-Pr<sub>3</sub>C<sub>6</sub>H<sub>2</sub> [4], and N-tosylaziridine [5] were prepared according to a previously reported procedures referenced below. Pd<sub>2</sub>(dba)<sub>3</sub> Pd<sub>2</sub>(dba)<sub>3</sub> can also be purchased from Strem Chemical Co. All other chemicals were obtained commercially and used without further purification.

Please amend page 69, paragraph [0099] as follows:

A schlenk Schlenk tube was charged with (H<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>) {(2-C<sub>5</sub>H<sub>4</sub>N)CH<sub>2</sub>}NH (H<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>) {(2-C<sub>5</sub>H<sub>4</sub>N)CH<sub>2</sub>}NH (1.00 g, 6.62 mmol), 2-bromo-m-xylene (0.88 cm<sup>3</sup>, 1.23 g, 6.62 mmol), Pd<sub>2</sub>(dba)<sub>3</sub> (0.030 g, 0.033 mmol, 0.005 equiv.), rac-BINAP (0.062 g, 0.099 mmol, 0.015 equiv.), NaOBu<sub>t</sub> (1.91 g, 19.9 mmol, 3 equiv.) and toluene (40 cm<sup>3</sup>). The reaction mixture was heated to 100 °C and stirred for a period of 4 days. After cooling to room temperature, the solvent was removed under reduced pressure to afford an oily residue. The residue was dissolved in diethyl ether (30 cm<sup>3</sup>) and washed with water (3 x 30 cm<sup>3</sup>) and saturated sodium chloride solution (3 x 30 cm<sup>3</sup>). The organic layer was separated and dried over magnesium sulfate. The volatiles were removed under

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reduced pressure and the residue left under vacuum at ~~70~~ °C 70 °C 24 h to give 1.33 g (79%) of 1a as a viscous oil.

Please amend page 70, paragraph [0100] as follows:

Compound 1a: ES mass spectrum, m/z 256 [M+H]+. IR (nujol mull, cm-1), ~~3350~~ v 3350 (N-H, medium). 1H NMR ( $\text{CDCl}_3$  CDCl<sub>3</sub>, 250 MHz, ppm), ~~2.20~~ δ 2.20 (s, 6H, Meo), 2.77 (t, 2H, 3JH-H 5.7 Hz,  $\text{CH}_2$  CH<sub>2</sub>), 3.02 (t, 2H, 3JH-H 5.7 Hz, - $\text{CH}_2$  CH<sub>2</sub>, 3.85 (s, 2H, Py- $\text{CH}_2$  CH<sub>2</sub>), 6.70 (m, 1H, Ar-CH), 6.88 (m, 2H, Ar-CH), 7.06 (m, 1H, Py-CH), 7.20 (d, 1H, 3JH-H 7.8 Hz, Py-CH), 7.52 (dt, 1H, 3JH-H 7.8 Hz, Py-CH), 8.50 (dd, 1H, 3JH-H 4.4 Hz, Py-CH). 13C NMR ( $\text{CDCl}_3$  CDCl<sub>3</sub>, 250 MHz, ppm, 1H composite pulse decoupled): ~~19.0~~ δ 19.0 (2C, Meo), 48.4 (1C,  $\text{CH}_2$  CH<sub>2</sub>), 50.0 (1C,  $\text{CH}_2$  CH<sub>2</sub>), 55.4 (1C, Py- $\text{CH}_2$  CH<sub>2</sub>), 121.9 (1C, Py-CH), 122.4 (1C, Py-CH), 122.6 (1C, Ar-CH), 129.2 (2C, Ar-CH), 129.7 (2C, Ar-C), 136.9 (1C, Py-CH), 146.8 (1C, Ar-C), 149.7 (1C, Py-CH), 160.3 (1C, Py-C).

Please amend page 70, paragraph [0102] as follows:

Compound 1b: ES mass spectrum, m/z 270 [M+H]+. NMR ( $\text{CDCl}_3$  CDCl<sub>3</sub>, 293 K): 1H NMR ~~8.7~~ δ 8.7 – 7.1 (m, 4H, Py-H), 6.84 (s, 2H, Ar-H), 3.98 (s, 2H, Py- $\text{CH}_2$  CH<sub>2</sub>, 2H), 3.09 (t, 2H,  $\text{CH}_2$  CH<sub>2</sub>), 2.89 (t, 2H,  $\text{CH}_2$  CH<sub>2</sub>), 2.29 (s, 6H, Meo) and 2.21 (s, 3H, Mep). 13C (1H composite pulse decoupled), ~~159.9~~ δ 159.9 (s, C, Py), 149.4 (s, C, Py), 143.8 (s, C, Ar), 136.5 (s, C, Py), 129.5 (s, C, Ar), 129.1 (s, C, Ar), 122.2 (s, C, Py), 122.1 (s, C, Py), 122.0 (s, C, Ar), 55.1 (s,  $\text{CH}_2$  CH<sub>2</sub>), 49.7 (s,  $\text{CH}_2$  CH<sub>2</sub>), 48.4 (s,  $\text{CH}_2$  CH<sub>2</sub>), 20.6 (s, Mep) and 18.5 (s, Meo).

Please amend page 71, carried over to page 72, paragraph [0106] as follows:

Compound ( $\text{H}_2\text{NCH}_2\text{Cl}_2$ ) $\{(2\text{-C}_5\text{H}_4\text{NCH}_2)_2\text{N}(\text{H}_2\text{NCH}_2\text{CH}_2)\{2\text{-C}_5\text{H}_4\text{N}\}\text{CH}_2\}_2\text{N}$ : ES mass spectrum, m/z 243, [M+H]+. IR ( $\text{CH}_2\text{Cl}_2$  CH<sub>2</sub>Cl<sub>2</sub>, cm-1): ~~3360~~ v 3360 (N-H), 3288 (N-H, C-H). 1H NMR ( $\text{CDCl}_3$  CDCl<sub>3</sub>, 250 MHz, ppm): ~~1.65~~ δ 1.65 (s, 2H,

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NH<sub>2</sub> NH<sub>2</sub>), 2.67 (t, 2H, 3JH-H 5.7 Hz, CH<sub>2</sub> CH<sub>2</sub>), 2.80 (t, 2H, 3JH-H 5.6 Hz, CH<sub>2</sub> CH<sub>2</sub>), 3.85 (s, 4H, Py-CH<sub>2</sub> Py-CH<sub>2</sub>), 7.14 (dt, 2H, 3JH-H 7.5, 5 Hz, 4JH-H 1.4 Hz, Py-CH), 7.49 (d, 2H, 3JH-H 7.75 Hz, Py-CH), 7.65 (dt, 2H, 3JH-H 7.5 Hz, 4JH-H 1.6 Hz, Py-CH), 8.53 (d, 2H, 3JH-H 5 Hz, 4JH-H 1.6 Hz, Py-CH). <sup>13</sup>C NMR (<sup>13</sup>CDCl<sub>3</sub> <sup>13</sup>CDCl<sub>3</sub>, 300 MHz, ppm, 1H composite pulse decoupled):  $\delta$  39.9- $\delta$  39.9 (1C, CH<sub>2</sub> CH<sub>2</sub>), 57.8 (1C, CH<sub>2</sub> CH<sub>2</sub>), 61.1 (2C, Py-CH<sub>2</sub> Py-CH<sub>2</sub>), 122.4 (2C, Py-CH), 123.4 (2C, Py-CH), 136.8 (2C, Py-CH), 149.4 (2C, Py-CH), 160.0 (2C, Py-C).

Please amend page 72, paragraph [0107] as follows:

A schlenk Schlenk tube was charged with (H<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>)<sub>2</sub>(2-C<sub>5</sub>H<sub>4</sub>N)CH<sub>2</sub>2N (H<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>){2-C<sub>5</sub>H<sub>4</sub>N}CH<sub>2</sub>2N (1.60 g, 6.62 mmol), 2-bromo-m-xylene (0.88 cm<sup>3</sup>, 1.23 g, 6.62 mmol), Pd2(dba)3 (0.030 g, 0.033 mmol, 0.005 equiv.), rac-BINAP (0.062 g, 0.099 mmol, 0.015 equiv.), NaOBu (1.91 g, 19.9 mmol, 3 equiv.) and toluene (40 cm<sup>3</sup>). The reaction mixture was heated to 100 oC and stirred for a period of 4 days. After cooling to room temperature, the solvent was removed under reduced pressure to afford an oily residue. The residue was dissolved in diethyl ether (30 cm<sup>3</sup>) and washed with water (3 x 30 cm<sup>3</sup>) and saturated sodium chloride solution (3 x 30 cm<sup>3</sup>). The organic layer was separated and dried over magnesium sulfate. The volatiles were removed under reduced pressure and the residue left under vacuum at 70-oC 70°C for 24 h to give 1.71 g (75%) of 2a as a viscous red oil.

Please amend page 72, paragraph [0108] as follows:

Compound 2a: ES mass spectrum: m/z 369 [M+Na]<sup>+</sup>, 347 [M+H]<sup>+</sup>. IR (nujol mull, cm<sup>-1</sup>):  $\nu$  3354- $\nu$  3354 (C=N), 1589 (pyridine C=N, C=C), 1H NMR (<sup>13</sup>CDCl<sub>3</sub> <sup>13</sup>CDCl<sub>3</sub>, 250 MHz, ppm):  $\delta$  2.2s- $\delta$  2.2 (s, 6H, -CH<sub>3</sub> CH<sub>3</sub>), 2.8 (t, 2H, 3JH-H 6 Hz, CH<sub>2</sub> CH<sub>2</sub>), 3.1 (t, 2H, 3JH-H 6 Hz, CH<sub>2</sub> CH<sub>2</sub>), 3.8 (s, 4H, CH<sub>2</sub> CH<sub>2</sub>), 6.68 (m, 1H, 3JH-H 7.56, 7.12 Hz, CH), 6.87 (t, 1H, 3JH-H 7.37 Hz, CH), 7.07 (m, 2H, 3JH-H 4.8, 6 Hz, CH), 7.42 (d, 2H, 3JH-H 8.1 Hz, C<sub>4</sub>H C<sub>4</sub>H), 7.6 (t, 2H, 3JH-H 6, 7.8 Hz, CH), 8.47 (d, 2H, 3JH-H 4.8 Hz, CH). <sup>13</sup>C NMR (<sup>13</sup>CDCl<sub>3</sub> <sup>13</sup>CDCl<sub>3</sub>, 250 MHz, ppm):  $\delta$  19.2- $\delta$  19.2 (2C, CH<sub>3</sub> CH<sub>3</sub>),

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46.2 (1C,  $\text{CH}_2\text{CH}_2$ ), 55.0 (1C,  $\text{CH}_2\text{CH}_2$ ), 60.8 (2C,  $\text{CH}_2\text{CH}_2$ ), 121.5 (1C, CH), 122.5 (2C, CH), 123.5 (2C, CH), 129.2 (2C, CH), 136.8 (2C, CH), 128.9 (2C, C), 147.0 (1C, C), 149.6 (2C, CH), 159.7 (2C, C).

Please amend page 73, paragraph [0110] as follows:

Compound 2b: ES mass spectrum: m/z 383 [M+Na]+, 361 [M+H]+. IR (nujol mull, cm-1):  $\text{v}_\text{C-N}$  3355 (C-N), 1589 (pyridine C=N, C=C). 1H NMR ( $\text{CDCl}_3$   $\text{CDCl}_3$ , 250 MHz, ppm):  $\delta$  2.12 (s, 9H,  $\text{CH}_3\text{CH}_3$ ), 2.76 (t, 2H, 3JH-H 6 Hz,  $\text{CH}_2\text{CH}_2$ ), 3.02 (t, 2H, 3JH-H 6 Hz,  $\text{CH}_2\text{CH}_2$ ), 3.81 (s, 4H,  $\text{CH}_2\text{CH}_2$ ), 6.69 (s, 2H, CH), 7.06 (t, 2H, 3JH-H 7.5, 5 Hz, CH), 7.42 (d, 2H, 3JH-H 8 Hz, CH), 7.56 (m, 2H, 3JH-H 7.5 Hz, CH), 8.46 (d, 2H, 3JH-H 5 Hz, CH). 13C NMR ( $\text{CDCl}_3$   $\text{CDCl}_3$ , 250 MHz, ppm):  $\delta$  17.6, 17.6 (2C,  $\text{CH}_3\text{CH}_3$ ), 19.5 (1C,  $\text{CH}_3\text{CH}_3$ ), 45.1 (1C,  $\text{CH}_2\text{CH}_2$ ), 53.6 (1C,  $\text{CH}_2\text{CH}_2$ ), 59.3 (2C,  $\text{CH}_2\text{CH}_2$ ), 121.0 (2C, CH), 122.1 (2C, CH), 127.9 (2C, C), 128.4 (2C, CH), 129.5 (1C, C), 135.3 (2C, CH), 142.9 (1C, C), 148.1 (2C, CH), 158.3 (2C, C).

Please amend page 73, carried over to page 74, paragraph [0112] as follows:

Compound 2c: ES mass spectrum: m/z 369 [M+Na]+, 347 [M+H]+. IR (nujol mull, cm-1):  $\text{v}_\text{C-N}$  3350 (C-N), 1588 (pyridine C=N, C=C). 1H NMR ( $\text{CDCl}_3$   $\text{CDCl}_3$ , 250 MHz, ppm):  $\delta$  2.10 (s, 3H,  $\text{CH}_3\text{CH}_3$ ), 2.13 (s, 3H,  $\text{CH}_3\text{CH}_3$ ), 2.83 (t, 2H, 3JH-H 6 Hz,  $\text{CH}_2\text{CH}_2$ ), 3.12 (t, 2H, 3JH-H 6 Hz,  $\text{CH}_2\text{CH}_2$ ), 3.79 (s, 4H,  $\text{CH}_2\text{CH}_2$ ), 6.35 (d, 1H, 3JH-H 8.47 Hz, CH), 6.79 (m, 2H, 3JH-H 6 Hz, CH), 7.05 (t, 2H, 3JH-H 7, 6, 5 Hz, CH), 7.37 (d, 2H, 3JH-H 7.8 Hz, CH), 7.53 (t, 2H, 3JH-H 7.5 Hz, CH), 8.45 (d, 2H, 3JH-H 4.8 Hz, CH). 13C NMR ( $\text{CDCl}_3$   $\text{CDCl}_3$ , 250 MHz, ppm):  $\delta$  17.9, 17.9 (1C,  $\text{CH}_3\text{CH}_3$ ), 20.73 (1C,  $\text{CH}_3\text{CH}_3$ ), 41.7 (1C,  $\text{CH}_2\text{CH}_2$ ), 53.1 (1C,  $\text{CH}_2\text{CH}_2$ ), 60.6 (2C,  $\text{CH}_2\text{CH}_2$ ), 110.3 (1C, CH), 122.5 (2C, CH), 122.5 (2C, C), 123.4 (2C, CH), 126.1 (1C, C), 127.7 (1C, CH), 131.2 (1C, CH), 136.8 (2C, CH), 144.7 (1C, C), 149.6 (2C, CH), 159.8 (2C, C).

Please amend page 74, paragraph [0113] as follows:

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All complexation reactions were carried out under an atmosphere of dry, oxygen-free nitrogen, using standard Schlenk tube techniques or in a nitrogen purged glove box. n-Butanol was dried and deoxygenated by distillation over sodium metal under nitrogen. The metal dichlorides were purchased from Aldrich Chemical Co. and used without any further purification. FAB mass spectra were recorded using a Kratos Concept spectrometer with NBA (nitrobenzyl alcohol) as the matrix [samples placed on the end of probe within matrix and bombarded with xenon atoms at ca. 7 kV; Mach3 software, probe temperature  $50^{\circ}\text{C}$   $50^{\circ}\text{C}$ ]. Elemental analyses were performed by S. Boyer at the Department of Chemistry, University of North London (UK). Data for the crystal structure determinations were collected on a Bruker APEX 2000 CCD diffractometer and solved using SHELXTL version 6.10. Magnetic susceptibility studies were performed using an Evans Balance at ambient temperature.

**Please amend page 75 carried over to page 76, paragraph [0114] as follows:**

A solution of 1a (0.100 g, 0.39 mmol) in n-butanol (5 cm<sup>3</sup>) was introduced dropwise to a solution of  $\text{CeCl}_2$   $\text{CoCl}_2$  (0.051 g, 0.39 mmol) in n-butanol (5 cm<sup>3</sup>) at  $90^{\circ}\text{C}$   $90^{\circ}\text{C}$  to form a green/blue solution. After being stirred at  $90^{\circ}\text{C}$   $90^{\circ}\text{C}$  for 1 h, the reaction was allowed to cool to room temperature. The reaction mixture was concentrated and hexane added to induce precipitation of the product. The suspension was stirred overnight, filtered, washed with hexane (2 x 30 cm<sup>3</sup>) and dried under reduced pressure to afford 0.121 g (80%) of 3a as a pale green solid.

**Please amend page 76, paragraph [0115] as follows:**

Complex 3a: FAB mass spectrum: m/z 385 [M]<sup>+</sup>, 350 [M-Cl]<sup>+</sup>  $\mu_{\text{eff}}$   $\mu_{\text{eff}}$  (Evans Balance) 3.8 BM.  $\text{C}_{16}\text{H}_{21}\text{N}_3\text{CeCl}_2$   $\text{C}_{16}\text{H}_{21}\text{N}_3\text{CoCl}_2$  : calcd. C 49.89, H 5.49, N 10.91; found C 50.01, H 5.61, N 10.80%.

**Please amend page 76, paragraph [0118] as follows:**

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Complex 3b: FAB mass spectrum: m/z 399 [M]+, 364 [M-Cl]+  $\Xi_{\text{eff}} \mu_{\text{eff}}$  (Evans Balance)  
3.7 BM. C<sub>17</sub>H<sub>23</sub>N<sub>3</sub>CoCl<sub>2</sub>CH<sub>3</sub>CN C<sub>17</sub>H<sub>23</sub>N<sub>3</sub>CoCl<sub>2</sub>CH<sub>3</sub>CN calcd. C 51.83, H 5.95, N 12.73; found C 51.84, H 5.97, N 12.61%.

Please amend page 77, paragraph [0123] as follows:

Complex 4a: FAB mass spectrum: m/z 382 [M]+, 347 [M-Cl]+  $\Xi_{\text{eff}} \mu_{\text{eff}}$  (Evans Balance)  
4.9 BM. C<sub>16</sub>H<sub>21</sub>N<sub>3</sub>FeCl<sub>2</sub> C<sub>16</sub>H<sub>21</sub>N<sub>3</sub>FeCl<sub>2</sub>: calcd. C 50.29, H 5.54, N 11.00; found C 49.65, H 5.62, N 10.62%.

Please amend page 77, paragraph [0126] as follows:

Complex 4b: FAB mass spectrum: m/z 396 [M]+, 361 [M-Cl]+  $\Xi_{\text{eff}} \mu_{\text{eff}}$  (Evans Balance)  
5.0 BM. C<sub>17</sub>H<sub>22</sub>N<sub>3</sub>FeCl<sub>2</sub> C<sub>17</sub>H<sub>22</sub>N<sub>3</sub>FeCl<sub>2</sub>: calcd. C 51.68, H 5.61, N 10.63; found C 51.59, H 5.51, N 10.63%.

Please amend page 78, paragraph [0129] as follows:

A solution of 2a (0.100 g, 0.29 mmol) in n-butanol (5 cm<sup>3</sup>) was added dropwise to a solution of GeCl<sub>2</sub> CoCl<sub>2</sub> (0.037 g, 0.32 mmol) in n-butanol (5 cm<sup>3</sup>) at 90- $^{\circ}$ C 90<sup>°</sup>C to yield a green solution. After being stirred at 90- $^{\circ}$ C 90<sup>°</sup>C for 1 h, the reaction was allowed to cool to room temperature. The reaction mixture was concentrated and hexane added to induce precipitation of the product. The suspension was stirred overnight, filtered, washed with hexane (2 x 30 cm<sup>3</sup>) and dried under reduced pressure to afford 5a as a pale green solid (0.110 g, 80%).

Please amend page 82, under Table 2 as follows:

<sup>a</sup>General Conditions: Toluene solvent (40 cm<sup>3</sup>), 25 °C, reaction time 30 min, ethylene pressure 1 bar, reaction quenched with dilute HCl; <sup>b</sup>MAO = methylalumoxane; <sup>c</sup>

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Determined from GC using extrapolated values based on a Schulz-Flory distribution for C4-C8 C<sub>4</sub>-C<sub>8</sub> and C22-C26 C<sub>22</sub>-C<sub>26</sub> for runs 1-3 and C4-C10 C<sub>4</sub>-C<sub>10</sub> for C26 C<sub>26</sub> for runs 4/5 employing 1-heptadecene as an internal standard. <sup>d</sup>K =  $\langle \rangle = n(C_{n+2} \text{ olefin})/n(C_n \text{ olefin})$ , where  $n(C_n \text{ olefin})$  is the number of moles of olefin containing  $n$  carbon atoms, and  $n(C_{n+2} \text{ olefin})$  is the number of moles of olefin containing  $n+2$  carbon atoms, and is the rate of propagation over the sum of the rate of propagation and the rate of chain transfer. <sup>e</sup> $\beta = (1-\langle \rangle)/\langle \rangle$  and is the rate of chain transfer over the rate of propagation.